

Chapter 11

Alternatives Analysis

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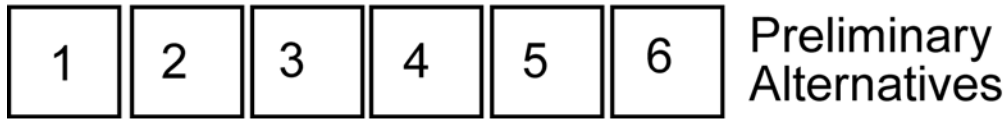
Alternative Analysis Process

- High Level Planning to Detailed Analysis
- Essential For All Decision Makers and Stakeholders
- Integral to Design Development

Alternative Analysis Steps

- Transportation System Planning
 - Local Arterial Network
 - Identify Future Interstate Access Locations
 - Sketch Planning
- Interchange Type Selection
- Scenario Testing: Optimizing Freeway Design
- Sensitivity Testing: Validating Design

Screening Alternatives



Screening of Preliminary alternatives:

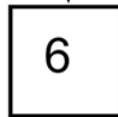
- Traffic Assessment using HCM
- Environmental Constraints
- Design Feasibility
- Constructability



2-3 Viable Alternatives

Detailed Analysis of Alternatives:

- Traffic Simulation
- 30% Design Plans
- EAW, EA, or EIS
- Safety Analysis
- Cost-Benefit



Recommended Alternative

Sensitivity Testing of Alternatives:

- Simulation different traffic pattern
- Design Refinements

System Planning

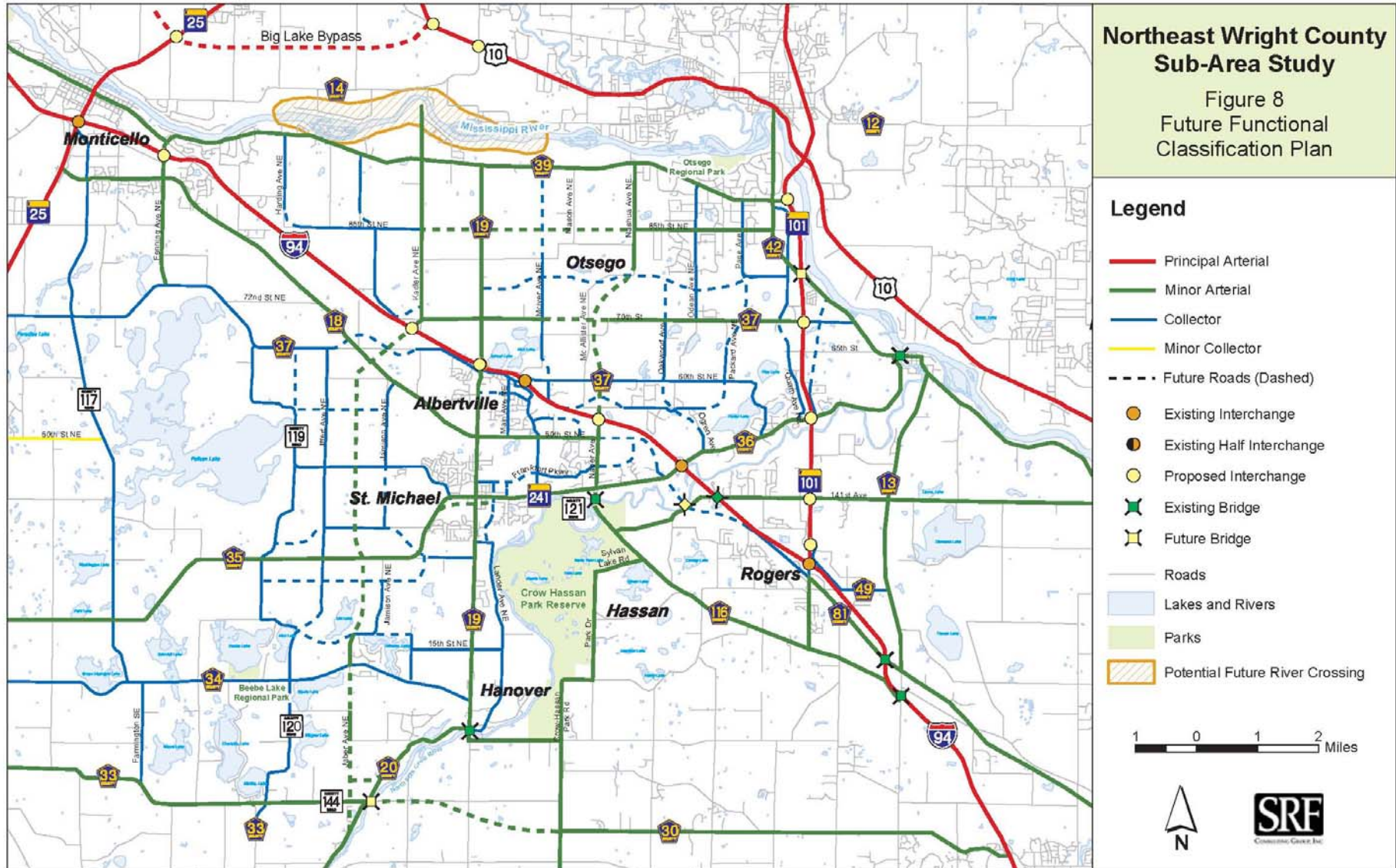
- Develop A Local Arterial System That Will Support The Freeway System
- Identify Access Locations Based On Needs
- Provide Basic Sizing Of Roadways

FHWA Criteria No. 5

The proposal considers and is consistent with local and regional land use and transportation plans.

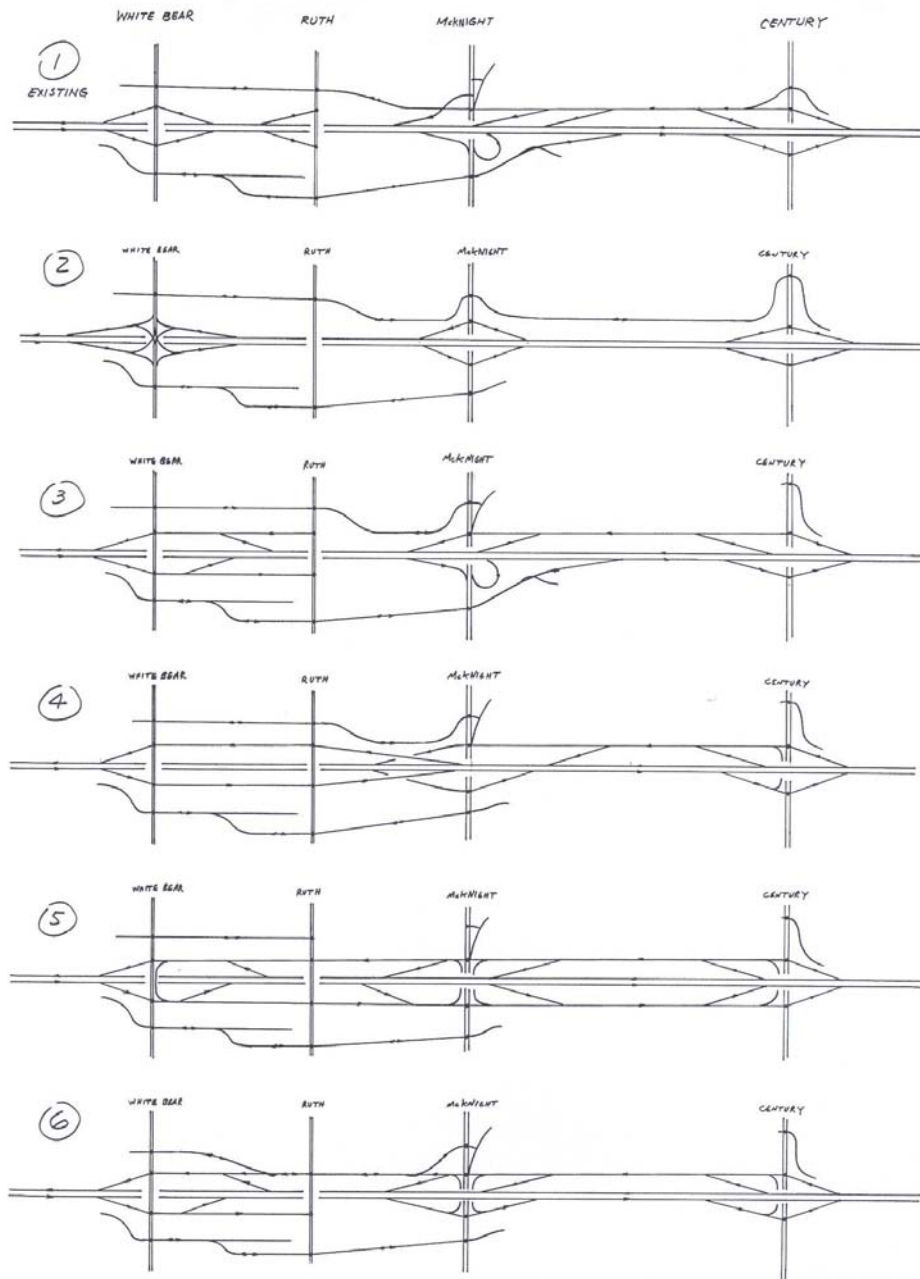
System Planning Example:

NE Wright County



Sketch Planning

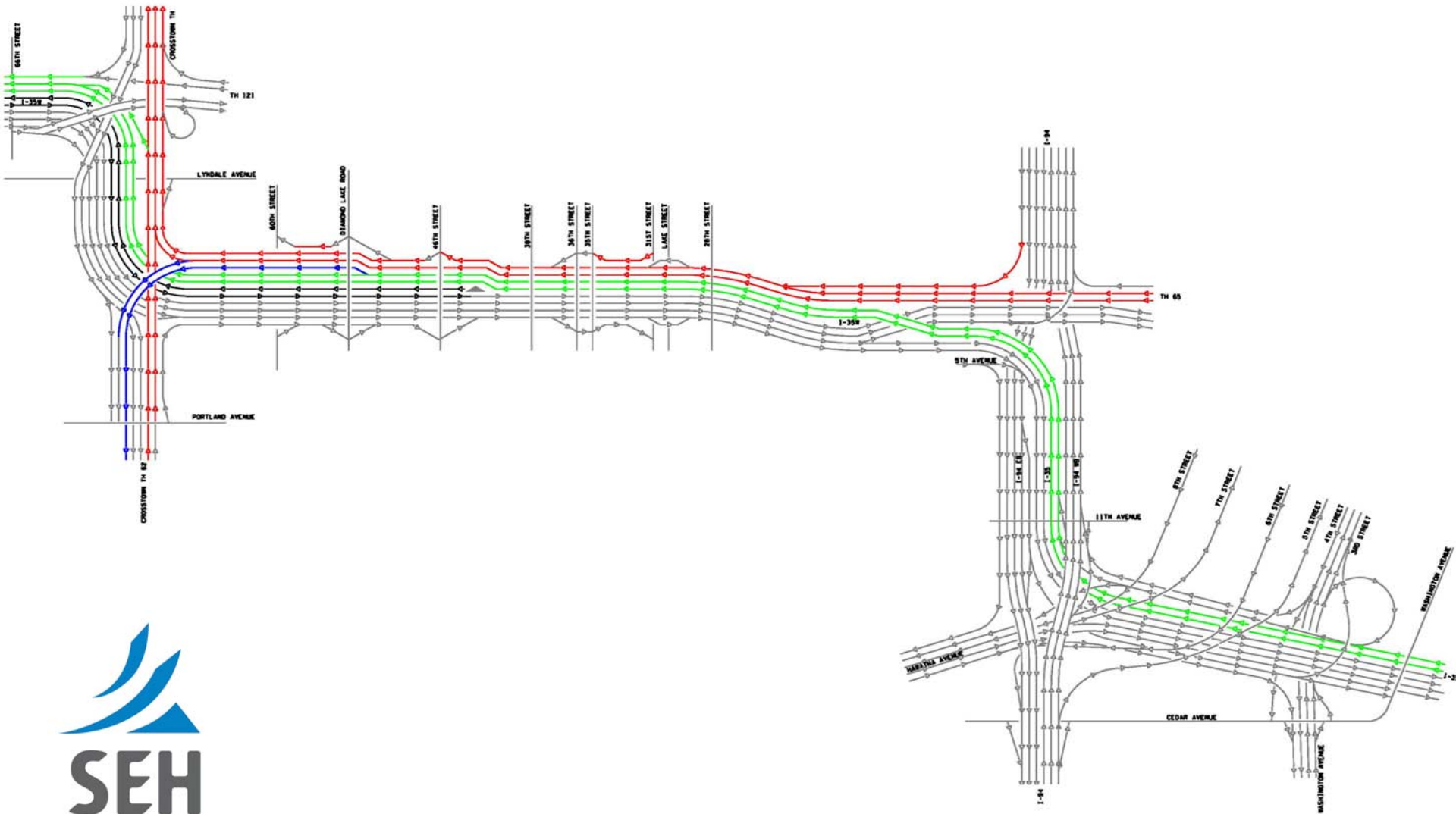
- Process For Quickly Identifying Design Alternatives
- Design Standards and HCM Techniques Used as a Guide For Developing Alternatives
- Allows For Considering a Wider Range of Ideas



Sketch Planning: Access Alternatives

Source: Metro Freeway Method Study
CH2MHill

Sketch Planning: Evaluation of Lane Continuity



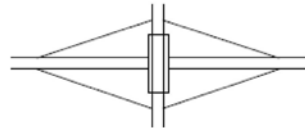
Interchange Type Selection

- Use Sketch Planning Techniques to Screen Down Range of Alternatives
- Determine Type to be Most Compatible With Freeway System
- Incorporate Other Factors
 - Design Constraints
 - Construction Costs
 - Environmental Issues

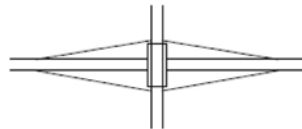
FHWA Criteria 2

All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.

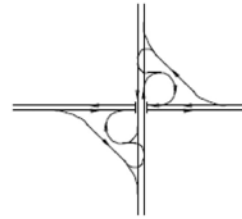
Interchange Type Selection



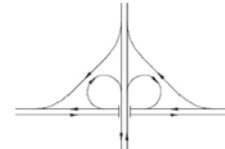
a - CONVENTIONAL DIAMOND



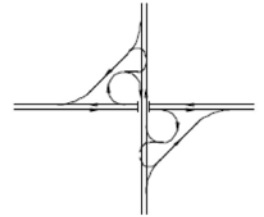
d - COMPRESSED DIAMOND



- G -
PARCLO A

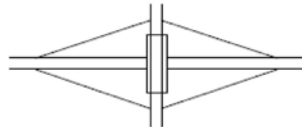


q - FOLDED DIAMOND / PARCLO AB

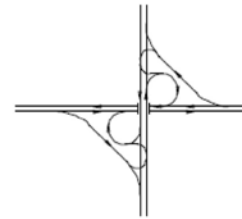


- D -
PARCLO B

Apply Screening Process

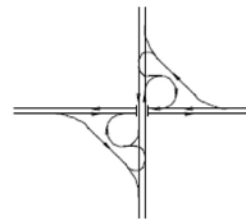


a - CONVENTIONAL DIAMOND



- G -
PARCLO A

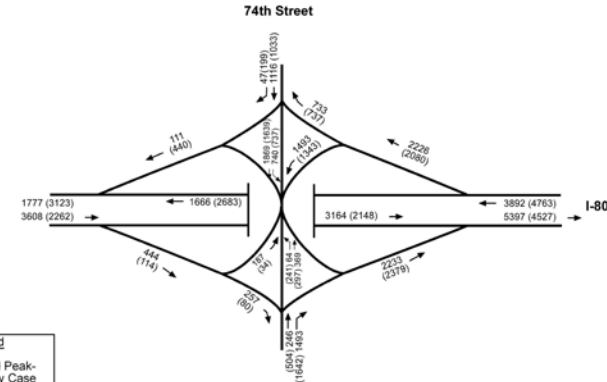
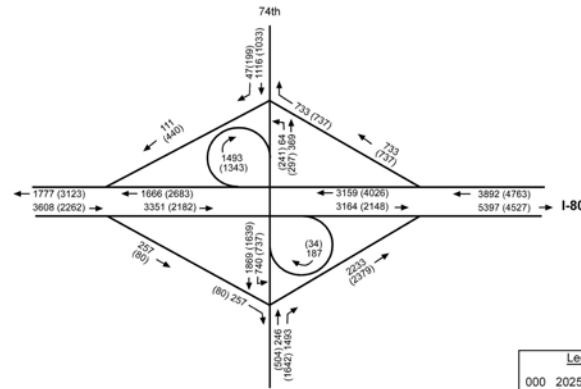
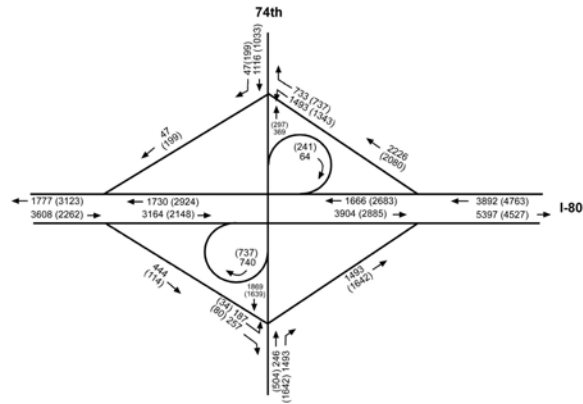
Evaluate Preferred
Alternatives in CORSIM



- G -
PARCLO A

Conducted Sensitivity Tests on
Preferred Alternative

Sketch Planning: Interchange Type Evaluation



Parclo A

Parclo B

SPUI

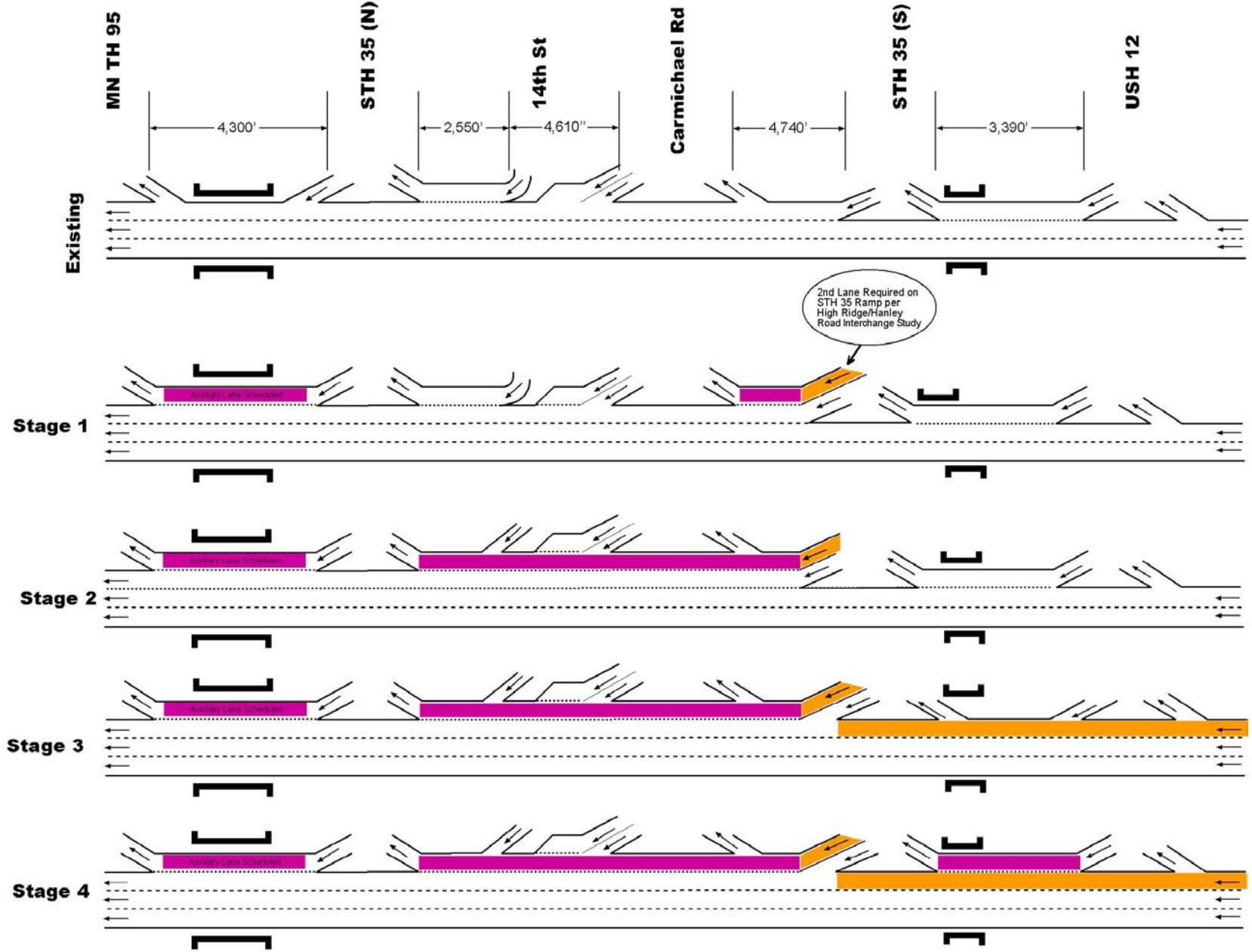
Scenario Testing

- Determine the Optimal Arrangement of:
 - Basic Lanes,
 - Auxiliary Lanes,
 - And Weave Lengths
 - Requires Minimal Effort Once Models Have Been Created

FHWA IAR Criteria No. 3

The proposed access point does not have a significant adverse impact on the safety and operation of the interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include analysis of sections of interstate to and including at least the first adjacent existing or proposed interchange on either side...

I-94 Scenario Evaluation: Auxiliary Lanes



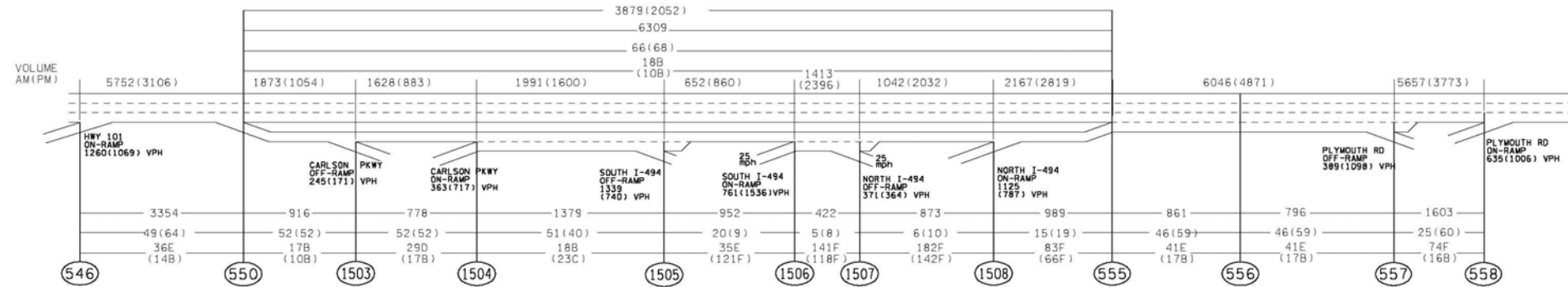
Final Analysis Requirements For Interstate Access Request

- Alternative Analyses Should Be Documented In A Freeway Study Report
- Interstate Access Request Analyses Include:
 - Existing Conditions
 - 20-year Build Alternative(s) And No-build
 - Sensitivity Testing
 - Year Opening Selected Build Alternative and No-build

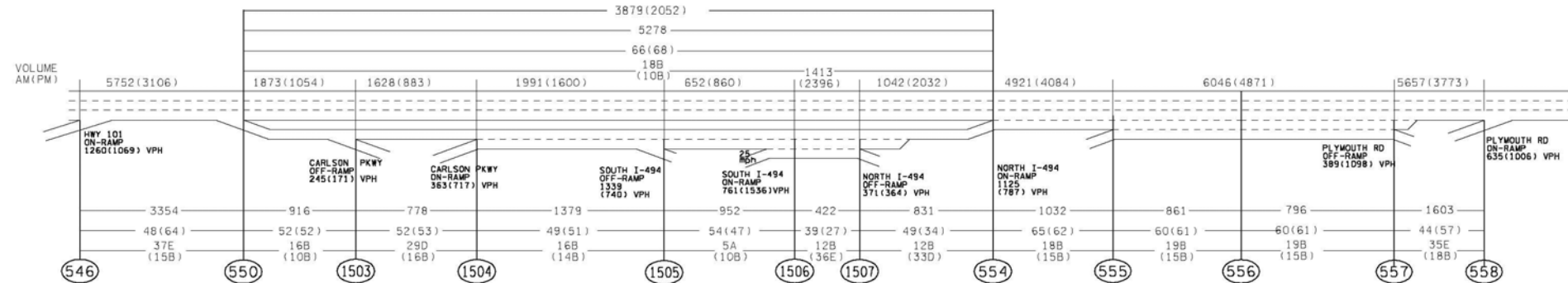
Required Scenarios for an Interstate Access Request

Time Frame	Build Scenario		
	Existing	No-Build	Build Alternative(s)
Existing			
Year Opening			
20-year Design			

20-year Design CORSIM Analysis

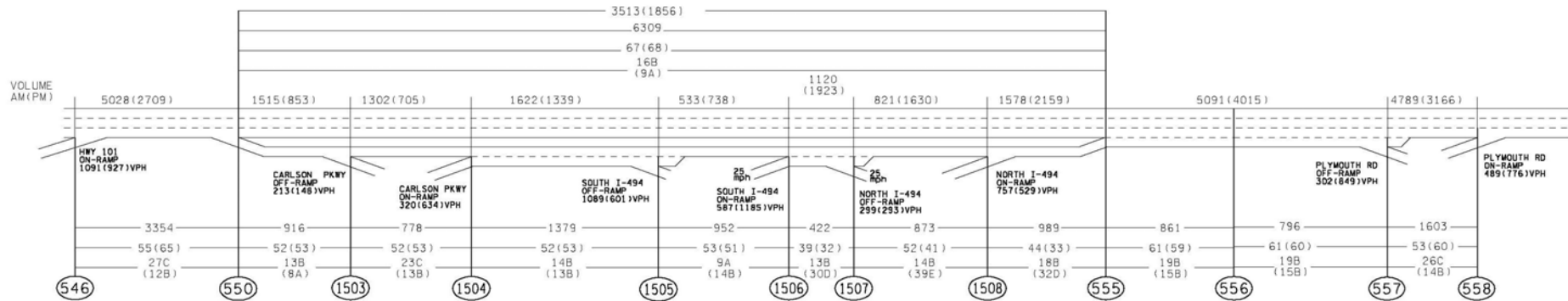


A. BUILD I494, NO BUILD I-394 LANE SCHEMATIC

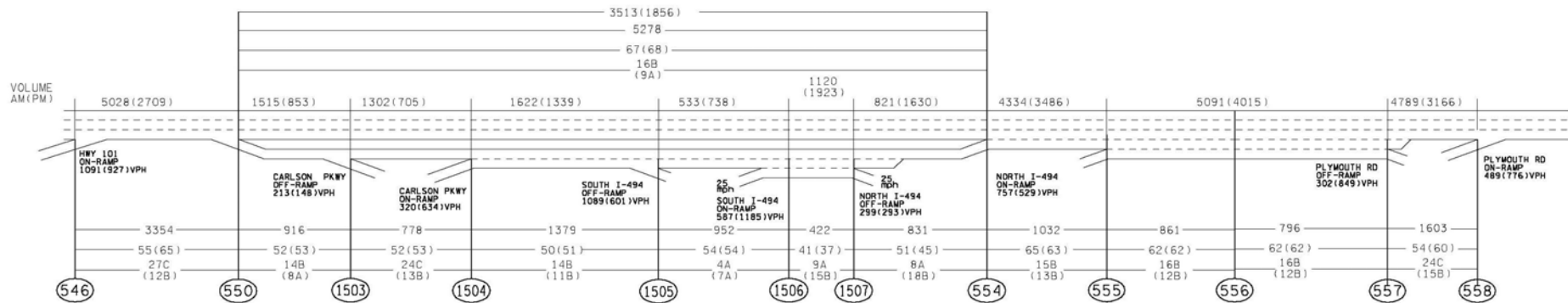


B. BUILD I-494, BUILD I-394 OPTION A LANE SCHEMATIC

Year Opening CORSIM Analysis



A. BUILD I494, NO BUILD I-394 LANE SCHEMATIC



B. BUILD I-494, BUILD I-394 OPTION A LANE SCHEMATIC